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SOME EARLY TEACHERS OF CHEMISTRY IN AMERICA.

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The science of chemistry, as we know it, may be said to have had its inception in the work of Johann Joachim Becher, who published several books relating to chemistry some time after the middle of the seventeenth century. Becher's ideas, however, were so radically different from those held by the then dominating sect of iatrochemists that it was not until several decades later that they were finally adopted, in a modified form, by Georg Ernst Stahl as the basis of his theory of phlogiston. According to this theory it was supposed that a substance, which Stahl called phlogiston, formed a part of all combustible bodies and that its separation constituted fire.

This theory, although soon found to be untenable, contributed very largely to the rapid development of chemical philosophy that took place in the latter decades of the eighteenth century, when chemists and philosophers, who were divided into two sects or schools, followers of Stahl or Lavoisier, vied with each other to prove the correctness of their particular beliefs or theories by actual demonstrations and experiments. As is now generally recognized, it is to this experimental work, that was largely done to defend or to prove the correctness of an erroneous theory, that we are indebted for much of our present knowledge of chemical properties and phenomena.

Recognizing the, at that time, crude and undeveloped condition of chemical philosophy, it will not surprise us to find that the first

attempts at teaching the rudiments of this science, in this country, were humble indeed, and that the number of the earlier teachers or students, who were in a position to contribute in any way to the advancement of correct theories or facts, was indeed limited.

In reviewing the accomplishments and achievements of these pioneers in natural philosophy and chemistry, we must bear in mind, therefore, the peculiar conditions of their environment and the incomplete and undeveloped state of the science or art. We should not judge of their achievements by what they themselves have accomplished as practical chemists, but rather by the influence they have had, in a more general way, on their students, their times and their surroundings. In the following pages an attempt has been made to review the names of some of these earlier teachers, as near as possible chronologically, and to point out or to suggest the lines along which they have made themselves worthy of emulation or deserving of kindly remembrance on our part.

Probably the first regularly appointed teacher of natural philosophy in this country was John Winthrop, a descendant of Governor Winthrop, who was appointed professor of natural philosophy in the University of Cambridge, now better known as Harvard, in 1738.

John Winthrop, who died in 1779, was born in 1714. He was a graduate of Harvard and occupied the Hollis chair of natural philosophy in that institution for upward of forty years. The influence that John Winthrop had on the development of the physical and chemical sciences, indirectly at least, has been of considerable moment. It was largely due to the teaching and precept of John Winthrop that Benjamin Thompson, better known as Count Rumford, was induced to pursue his studies into the phenomena of light and heat that have contributed so much to advance scientific investigations along these lines.

In addition to this, Count Rumford, despite the fact that he had been practically expatriated and had spent the greater period of his life in England and in Germany, devised to Harvard University a considerable sum with which to endow a professorship "to teach by regular courses of academical and public lectures, accompanied by proper experiments, the utility of the physical and mathematical sciences for the improvement of the useful arts and for the extension of the industry, happiness and well-being of society."

Among other then existing schools that followed the example

of Harvard, the most conspicuous for progressiveness was the Academy, later known as the College, of Philadelphia, founded by Benjamin Franklin in 1749. The Board of Trustees of this institution, in 1754, elected Mr. William Smith, "a gentleman lately arrived from London," to teach logic, rhetoric, ethics and natural philosophy.

In the latter department he was assisted, after 1758, by the Rev. Dr. John Ewing, who, in that year, was elected professor of natural and experimental philosophy.

The institution of medical schools necessitated a fuller and more exhaustive exposition of what was then known of medical chemistry. Dr. John Morgan, the founder of the first medical school in America, was also the first to teach this special branch of chemistry, or, as he defines it, in his "Discourse on the Introduction of Medical Schools," "pharmaceutic chemistry, that branch of philosophic chemistry which regards the particular properties of such bodies as are appropriated to medicine."

Dr. Morgan was succeeded in the chair of chemistry by Dr. Benjamin Rush, who, at the suggestion of John Morgan, had paid special attention to the study of chemistry while abroad.

Dr. Rush was elected professor of chemistry in the College of Philadelphia in 1769. While it cannot be said that Rush was the first to teach chemistry in this country, he was probably the first to teach it in the more practical or demonstrative way that was being followed in the larger institutions of Europe. On his return from England he had brought with him "a compleat chymical apparatus," the gift of the proprietor, Thomas Penn. One of the special qualifications that fitted him to teach this branch in the newly established medical school was that he had seen every important chemical experiment carried out at least twice, and felt assured that he could duplicate them on his return.

Dr. Rush continued as professor of chemistry until after the breaking out of the Revolutionary War, when the courses of lectures in the medical department of the College of Philadelphia were, for the time being, discontinued.

In 1768, the year before the appointment of Dr. Rush as professor of chemistry in Philadelphia, Dr. James Smith was appointed professor of chemistry and *materia medica* in the medical school of Kings County, New York. Dr. Smith had studied at Leyden, and

was probably well grounded in the science as it was then known. He did not continue long as a teacher, as owing to his removal from New York, in 1770, he was succeeded in the chair of chemistry by Dr. Samuel Bard, the founder of the medical school in Kings College, who was also the professor of the theory and practice of physic. This school, like the one in Philadelphia, was discontinued during the Revolutionary war. In 1792 it was reorganized as the medical department of Columbia College, and Dr. Nicholl was elected professor of chemistry.

Fortunes of war and Pennsylvania politicians had, in the meantime, played sad havoc with the College of Philadelphia. The legislature of the State had, in November, 1779, passed an act abrogating the charter of the College, confiscating its estates and removing from office all officials, professors and others, in any way connected with the institution. In extenuation of this summary action on the part of the legislature, it may be said that the provost of the college, Dr. William Smith, was suspected of being in favor of the royalist party, and that a number of the members of the board of trustees were thought to be antagonistic to the new government.

The confiscated estates were transferred to a new institution, created by the legislature for that purpose, called the University of the State of Pennsylvania. Dr. John Ewing, who, it will be remembered, had been the assistant of Dr. William Smith in the College of Philadelphia, was elected provost and professor of natural philosophy, in which capacity he taught chemistry until his death in 1802. Considerable difficulty was experienced in trying to organize a medical faculty, and it was not until 1783 that the school was finally put in operation with practically the same faculty that had taught in the College of Philadelphia. Dr. Rush continued to teach chemistry until 1789, when he, with the other professors, resigned to accept the corresponding professorship in the then reorganized College of Philadelphia. In this capacity he was succeeded, on the death of John Morgan and his own advancement to the chair of the theory and practice of medicine, in 1789, by Caspar Wistar, who was elected professor of chemistry and of the institutes of physic. The officials of the University of the State of Pennsylvania decided to continue a medical department of their own, and Dr. James Hutchinson was elected professor of chemistry and materia medica. The career of Dr. Hutchinson is one of the most interest-

ing and most inspiring of the early medical practitioners of America. He was a graduate of the medical department of the College of Philadelphia, and has the distinction of being the first on this continent to win a prize for proficiency in chemistry. This prize, a gold medal, was awarded him in 1774 by the board of trustees of the College of Philadelphia for his superior knowledge in chemistry.

In 1773, after a competitive examination, James Hutchinson was selected to act as apothecary to the Pennsylvania Hospital. In this capacity he served until some time after his graduation from the College of Philadelphia, when he resigned, intending to go abroad to complete his medical education.

The breaking out of the Revolutionary War hastened his return. He sailed from France, in 1777, bearing important despatches from Benjamin Franklin to the Colonial Congress. When near the American coast the vessel he was in was chased by a British man-of-war. Dr. Hutchinson, being desirous of saving the despatches entrusted to him, succeeded in landing in an open boat. The ship itself was subsequently captured and with it Dr. Hutchinson lost not only his personal effects, but also a valuable medical library that he had gathered together while abroad. In 1779 Dr. Hutchinson was appointed by the Legislature to serve as a member of the Board of Trustees of the University of the State of Pennsylvania; he, however, persistently refused to accept any of the medical professorships until after the reorganization of the College of Philadelphia, when, as noted above, he accepted the chair of chemistry in the University Medical School. After the amalgamation of the two Philadelphia schools as the medical departments of the University of Pennsylvania, Dr. Hutchinson was elected to continue as professor of chemistry. Dr. Hutchinson died in the autumn of 1793 of epidemic yellow fever—a martyr to medical science and his own sense of duty to the poor of the city, in the terrible epidemic that ravaged Philadelphia in that year.

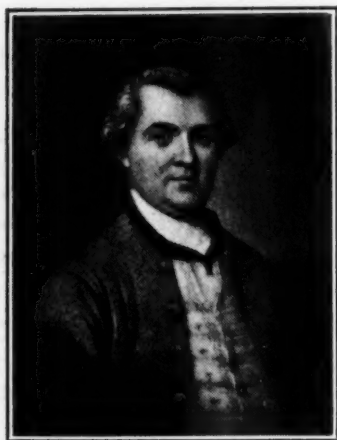
The chair of chemistry in the University of Pennsylvania, vacated by the death of Dr. Hutchinson, was conferred on Dr. John Carson, of whose chemical abilities very little is known, and who died before he entered on his duties as a professor.

Largely if not entirely through the influence of Dr. Rush, the position was then offered to the Rev. Dr. Joseph Priestley, who had but recently arrived in America. After having some correspondence

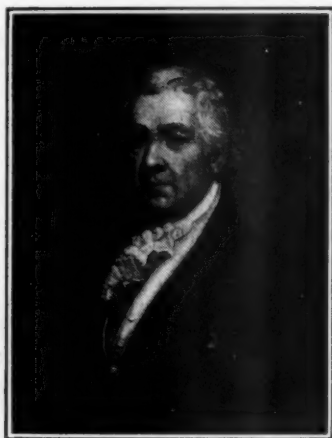
on the matter with Dr. Rush, Priestley declined the offer, preferring to end his remaining days quietly in his retreat on the shores of the Susquehanna.

The arrival of Priestley in America marks a new era in the history of the development of chemistry and chemical teaching in this country. Priestley, despite the fact that he had, at that time, made numerous original discoveries, and among other substances had discovered oxygen, was a staunch adherent of the theory of phlogiston, and despite his age he entered actively into the controversy that was then waging between the followers of the two schools.

Opposing him in this country were three men that deserve more



DR. JAMES HUTCHINSON
(1752-1793).



DR. SAMUEL LATHAM MITCHILL
(1764-1831).

than passing mention. The first of these, and the first to teach the principles of the Lavoisierian or antiphlogistic school of chemistry in America, was Dr. Samuel Latham Mitchill, who was elected professor of chemistry and natural history in Columbia College in 1792.

Dr. Mitchill was a man of considerable learning and of varied attainments; he was keenly alive to and fully appreciated the value of practical experience and original research, and, despite the fact that he was among the most persistent and aggressive of the opponents of Priestley, was also generally considered to be one of his staunchest friends. By far the greater number of the contributions relating to the controversy, on chemical philosophy, were published

in the earlier volumes of the *Medical Repository*, New York, one of the earliest of the regular medical publications, founded and edited by Samuel L. Mitchill (1797-1826).

From a pharmaceutical point of view the career of Dr. Mitchill is particularly interesting. He was practically the author of the *Pharmacopœia* of the New York Hospital, published in 1816, and was subsequently elected a delegate of the Medical Society of the State of New York to the district convention for the Middle States, which met in Philadelphia on the first day of June, 1819. There he was elected vice-president and appointed one of the delegates to the general convention that was to meet in Washington on the first day of January, 1820. As is well known, the general convention met in the Capitol at Washington, on the appointed date, to consider the feasibility and advisability of issuing a National *Pharmacopœia*. Dr. Samuel L. Mitchill was elected president, and as such deserves considerable of the credit for the successful inauguration of a national standard or *Pharmacopœia*.

In his controversy with Priestley, Mitchill was ably seconded by John MacLean, a native of Scotland, and a former pupil of Black and of Hope. Dr. MacLean was probably the first in this country to be elected to a chair of chemistry in a purely academical school. He was elected professor of chemistry at Nassau Hall, Princeton, in 1795. Dr. MacLean continued to teach at Princeton until some time after the beginning of the nineteenth century, when he accepted a similar position at William and Mary, in Virginia. The third opponent of Priestley was Dr. James Woodhouse, Priestley's successor as professor of chemistry in the University of Pennsylvania. Dr. Woodhouse was born in Philadelphia, November 17, 1770. He was elected professor of chemistry in 1795, and was probably the first in America to devote his time exclusively to the study and teaching of chemical science. Philadelphia about this time was the most populous and the most progressive city in the country. It was also considered the centre of medical as well as scientific knowledge, and attracted students from all sections of the United States. An excellent descriptive picture of Philadelphia, at the beginning of the nineteenth century, may be found in the memoirs of Benjamin Silliman, who, after his election as professor of chemistry at Yale, came to Philadelphia to absorb the rudiments of that science from Dr. Woodhouse. From these memoirs it would appear that the

lectures on chemistry, freely illustrated by actual experiments, were given in connection with the regular course of medical instruction in the medical department of the University of Pennsylvania. This department occupied a small building on South Fifth Street, opposite the State House yard, that was variously known as Surgeon's Hall, Anatomical Hall, or The Laboratory. It was in this same building



THE LABORATORY AND MEDICAL SCHOOL
(1765-1807).

From "The History of Medicine in the United States," by Francis
R. Packard, M.D.

that the first chemical society held its weekly meetings, and it was probably in the chemical laboratory, situated on the first floor, that Seybert, Hare, Woodhouse, Bryant and others of the more active members, made their analyses of and experiments with indigenous minerals.

This early chemical society was under the patronage of Drs. Seybert and Woodhouse, and included among its list of active members

such eminent medical practitioners as Dr. Benjamin Rush, John S. Dorsey and John C. Otto. At least one of the then existing apothecaries, John Y. Bryant, was an active member of the society. Mr. Bryant served the society as treasurer and also as a member of the Analyzing Committee. Prominent among the younger members of this society was Robert Hare, the inventor of the oxy-hydrogen blowpipe, and at a later period professor of chemistry in the University of Pennsylvania. Silliman, too, no doubt, attended the meetings of this society; at all events, he became intimately attached to and a warm admirer of Hare, the two working together in a private laboratory that they had contrived to fit up in the basement of their boarding-house.

There are, however, several teachers of the eighteenth century that should still be mentioned. At William and Mary, in Virginia, the Rev. James Madison, later Bishop of Virginia, was elected professor of natural philosophy in 1774. Despite his numerous other duties, Bishop Madison continued to teach until his death in 1812, when he was succeeded by Dr. John MacLean, the one-time professor of chemistry in Nassau Hall, Princeton.

At Yale Prof. Josiah Meigs delivered lectures on natural philosophy from 1794 to 1801. According to one of his pupils, Benjamin Silliman, "he was a gentleman of great intelligence and was well read in the chemical writers of the French school."

The first teacher of chemistry at Harvard, apart from natural philosophy, was Dr. Aaron Dexter, who, while not a brilliant teacher, or, according to an anecdote told by Oliver Wendell Holmes, not a very successful experimenter, was, nevertheless, instrumental in securing for Harvard University at least some of the material with which to lay the firm foundation on which the teaching of the science in that institution now rests. It was Dr. Aaron Dexter who, in 1782, induced Mr. William Erving, a wealthy citizen of Boston, to endow a chair of Chemistry and Materia Medica in the newly organized medical school of the University of Cambridge. To this chair Dr. Dexter was elected in 1783 and continued to teach until 1806, when he was succeeded by Dr. John Gorham, a brilliant lecturer and a very able teacher, who had been a fellow-student with Silliman, in Edinburgh, under Dr. Thomas Hope, then professor of chemistry.

Another chair of chemistry, founded before the beginning of the

nineteenth century, was that in the medical department of Dartmouth College, New Hampshire. This was occupied for several years by Dr. Lyman Spalding, who was elected professor of chemistry and materia medica in 1798.

Dr. Spalding was closely associated in later years with the origin and successful publication of the first United States Pharmacopœia. It was Dr. Spalding who, in 1817, submitted to the New York County Medical Society a project for the formation of a National Pharmacopœia, to be published by the authority of the medical societies and medical schools in the United States. His suggestion was adopted, and he was subsequently elected one of the delegates to the convention, where he was elected a member, and later chairman, of the Committee of Publication, thus being practically the editor of the first United States Pharmacopœia.

After the beginning of the nineteenth century chairs and teachers of chemistry increased rapidly. Of medical schools alone, Dr. James Thacher, in his "History of Medicine in America," enumerates no less than twenty existing in the United States in 1825. Few of the then professors contributed materially to advance the science of chemistry. By far the greater number of these teachers were actively engaged in, or more interested in, the practice of medicine than in chemical research. Notable exceptions were Robert Hare, professor of chemistry in the University of Pennsylvania, and Benjamin Silliman, of Yale, whose achievements in this particular field are so well and so favorably known that it will not be necessary to enumerate them at this time. Another notable exception that should be mentioned was Dr. Parker Cleaveland, who was elected professor of chemistry in Bowdoin College, Maine, in 1820, and who contributed materially to advance the general knowledge of chemical philosophy of his time.

The first quarter of the nineteenth century also saw the introduction of pharmaceutical and technical schools. The first of these, the Philadelphia College of Pharmacy, founded in 1821, elected as its first professor of chemistry Gerard Troost, a particularly able and scholarly man, who had studied chemistry at Leyden and was well versed in the theory as well as in the practice of the science. Troost subsequently became professor of chemistry and mineralogy in the University of Nashville. At the Philadelphia College of Pharmacy, he was followed in 1822 by Dr. George B. Wood, then quite a young

man, who later became well known as an author and also as a teacher in the medical department of the University of Pennsylvania.

The College of Pharmacy of the City of New York, founded in 1829, had as its first professor of chemistry John Torrey, who is deservedly esteemed for his attainments in various departments of science, and who was, at that time, considered one of the most successful instructors in chemistry in the United States.

In the Franklin Institute, Philadelphia, founded in 1824, Dr. W. H. Keating was elected the first professor of chemistry; he was followed several years later by Dr. Franklin Bache, who, as is well known, succeeded Dr. Wood as professor of chemistry in the Philadelphia College of Pharmacy.

In the Rensselaer Polytechnic Institute, Troy, N. Y., also founded in 1824, Amos Eaton was one of the first to teach chemistry.

Probably the first woman to teach chemistry in this country was Mrs. Almira H. Lincoln, the vice-principal of the Troy Female Seminary, who taught chemistry with considerable success in 1830, if not before.

Popular lectures on chemical subjects were probably instituted in Philadelphia in 1807, when Dr. Joseph Parrish gave a series of public lectures and demonstrations. Dr. Parrish continued his courses for several years with considerable success. The same idea was subsequently followed up by Dr. Benjamin Silliman and others, who gave regular courses of popular lectures that contributed very materially to the rapid spread of knowledge of the subject among people who would otherwise take little or no interest in this particular line.

Closely allied to popular lectures was the publication of scientific and technical journals. The first of these was the *American Mineralogical Journal*, published in 1810 and conducted by Dr. Archibald Bruce. This journal had a short and rather precarious existence, but is, nevertheless, interesting as being the pioneer of the numerous similar publications existing at the present time.

It was followed in 1818 by the publication of the *American Journal of Science*, edited by Professor Silliman. This journal has been a most important factor in the development of chemical philosophy.

THE JOURNAL OF THE PHILADELPHIA COLLEGE OF PHARMACY, the pioneer pharmaceutical journal in the English language, was first published in 1825. The history of this venture and its successful continuation has been so recently and so ably told by Professor

Kraemer (A. J. P., 1904, page 223) that it will only be necessary to refer to the facts at the present time.

One other of the early journals that should be mentioned is the *Journal of the Franklin Institute*. This was first published in 1826, and, like the preceding, still enjoys an enviable reputation in its own particular field.

WHEN SHALL HIGH-SCHOOL GRADUATION, OR ITS
EQUIVALENT, BE ENFORCED BY COLLEGES OF
PHARMACY AS A CONDITION OF ENTRANCE?

BY W. M. SEARBY.

I do not deem it necessary at this time to show by facts or argument the desirability of higher entrance requirements for admission to colleges of pharmacy. This I believe to be so universally conceded that it does not need any further enforcement; neither shall I attempt to show that it is desirable that the minimum requirement should be graduation from a high school (or the equivalent thereof), for this, I believe, is also practically conceded; nor will I go over the ground which I traversed in my paper before the American Pharmaceutical Association in 1902, in which I endeavored to show that high-school graduation was not only desirable, but feasible within a very few years, if concerted action could be secured by a few of the largest colleges. I wish to show in this paper that the time has actually arrived when decisive action should be and could be taken, so that high-school graduation would be actually demanded and enforced within a few years from the present date, considering, first, *WHEN* shall the advance be made toward this end, and, secondly, *how* shall it be done?

The advantages to be secured by such a course would, in my opinion, include the following:

- (1) A more intelligent and studious student body.
- (2) Greater uniformity of attainment by the students.
- (3) More satisfactory progress by the students while in college, and higher attainments at graduation.
- (4) A higher order of class and college spirit.
- (5) A more cultured and more highly respected graduate body.

I think the advance should be made now, and that it should be made gradually. I believe the majority of colleges now admit stu-

dents on grammar school graduation, or less. To bring the minimum to high-school graduation would mean an increase of from three to four years of academic instruction. Necessarily, the advance requirement must be made gradually, and in order to give those who are now in school preparing for a pharmaceutical career, or who have left school and are employed in pharmacies, the necessary time to prepare themselves for entrance, some notice of such advance should be generally diffused. If it were made known this year that no student could obtain entrance into a good school of pharmacy in the autumn of 1905 unless he had spent one year in high school, or had fitted himself, through private study, to take an examination covering the same work, these young people would have time to prepare themselves for entrance. And if it were further announced that every year or two additional high school work would be demanded, students would fit themselves to meet the requirements. It will be contended that large numbers of young persons would dodge this unwelcome preparatory study and content themselves either with going to such schools of pharmacy as kept their doors open to them, or would eschew college altogether, and trust to luck in getting through the State Board. This is true, doubtless, of a considerable number; but on the other hand a more desirable class of persons would come forward to seek entrance to a calling that has in it more dignity and higher public appreciation. Some years ago the entrance requirements for schools of pharmacy in Great Britain were somewhat suddenly and greatly advanced. It was expected that these requirements would almost empty the schools. To the astonishment of the faint-hearted ones, the very opposite was the effect, and for several years the number of students in pharmacy was greater than it had ever been, because many persons felt that pharmacy would be on a higher plane, and was, therefore, worthy of the serious attention of ambitious young men. It goes without saying that the intellectual calibre of those who entered pharmacy under the new conditions was considerably superior to that of their predecessors. While I do not anticipate an increased number of students under advanced entrance requirements in this country, I believe that the falling off would only be for one or two years, and that the moral effect of the new conditions would ultimately benefit the schools in the matter of attendance by causing every one that would enter a drug store with a view of following

pharmacy for life, to do so with the foregone conclusion that a course in a school of pharmacy was a necessary condition. At the present time there are thousands of young men in drug stores who have never been to a school of pharmacy and have no intention of going there. It is for us to bring about a condition of things that will make a pharmacy course essential, not necessarily by legal enactment, as in New York, though that is desirable, but from the force of universal sentiment. In medicine the man who essays to practice without a college diploma is regarded, not only by graduates in medicine, but by the public, as a quack. In dentistry it is rapidly becoming so, and, likewise, in the practice of law; yet, it is not many years since our large cities had great numbers of men practising all three of these professions without a college education. In dentistry in particular the change has been brought about with wonderful rapidity, and it has come because the public has realized that the graduates in that profession were the best men. It is for the leaders of pharmacy to bring about a like amelioration in the ranks of our own profession, but we cannot do it by sending into the world illiterate, half-educated graduates, whose general attainments are but little superior to those of the ungraduated. Let it be generally known that the holder of a diploma in pharmacy is, firstly, a man of general culture and, secondly, a man of good pharmaceutical education, and pharmacy will be respected by the public far more than it is now.

Specifically, what steps should be taken at this time to bring about a consummation so devoutly to be wished? Assuming that the American Pharmaceutical Association should commit itself to an expression of opinion in favor of a definite plan whereby, at certain dates, the minimum qualification for entrance should be, firstly, one year; secondly, two years; and, thirdly, graduation from a high school; and, assuming that the Conference of Pharmaceutical Faculties should also endorse the same plan, there would be such a large proportion of the best schools acting upon this procedure, that the effect upon other schools that held out against it would be that they would quickly take second rank in the esteem of pharmacists; and when a college once gets relegated to a second- or third-rate position among its competitors, its days as a successful financial institution are numbered. Such schools would, before long, be compelled to come into line.

But suppose that only a limited number of colleges, now members of the Conference of Pharmaceutical Faculties, should be willing to adopt this plan, what would be the result? If these colleges were among the smaller and less known institutions, the plan would probably be a failure, though that is by no means certain. Speaking for one of these smaller colleges in a remote portion of the country that has already made a beginning in the line here indicated, I would say that it is my impression that up to the present time our college has gained rather than lost by our advanced entrance requirements. We lost heavily for two years, but since that we have regained our attendance in the face of a competition as great as that in any part of the United States; for we have five colleges of pharmacy on the Pacific Coast, with an aggregate population, between British Columbia and Mexico, of only two millions and a half, and the others all admit on lower entrance qualifications than ours.

But if a few of the larger colleges, with their ample resources, their grand history and magnificent prestige, their eminent faculty and ample equipment, should adopt, at a very early date, high school entrance requirements, they would loom up head and shoulders above those who threw their doors open to practically all comers, and it would not be many years before the more lax colleges would find it to their interest to fall into line.

I almost feel like apologizing to the readers of the AMERICAN JOURNAL OF PHARMACY and the pharmacists of America for what has, thus far, been written, because I have treated the whole matter as if it were a commercial one. I have sought to show that the change indicated can be made without financial loss. I now go further and say that it ought to be made, even if it does involve financial loss. We took that position several years ago in our own school and bore our loss bravely, not knowing whether we should ever recoup ourselves. These strong financial institutions are vastly better able to make this experiment than we were. In the world's history few reforms of real value have been attained without sacrifice. Let the colleges of pharmacy show that they have the reformer's spirit, and are willing to do what they know would be best, even if it should entail upon them some financial loss. Such a position as I now advocate, taken by four or five of the largest colleges, would, I feel sure, result in such a large measure of success that they would, forever afterwards, congratulate themselves on the position they had taken.

I do not, at this time, discuss the minimum requirements for graduation. That is a very large subject, and is still more difficult to deal with than the matter of preliminary education. Even the medical and dental colleges, with all their years of experience, have only recently come to a general agreement as to length of time to be consumed in a college course, and, at present, I am not prepared to discuss this subject, because, in my judgment, the two matters can be best discussed separately.

BROMIDE OF POTASSIUM.

BY FRANCIS J. SMITH.

During the past eighteen months the writer has had occasion to examine a considerable number of samples of bromide of potassium, and, as a comparison of the quality of different manufacturers' goods over such an extended period may be of interest, it has been thought worth while to publish the results.

The salt was titrated in the usual way, and any excess of silver nitrate consumed was calculated into terms of chloride of potassium by the method for estimation of chlorides in presence of bromides given in "Muter's Analytical Chemistry," page 116. Chloride and carbonate are generally the only two impurities met with, and of these the former is usually present in larger proportion than the latter. Some few samples did contain an excessive amount of carbonate, and in those cases the results obtained by the above method would not be absolutely correct; but in the majority of cases, where the amount of carbonate did not exceed the small quantity allowed by the U.S.P., the results would hardly be affected.

Where a larger proportion of carbonate exists, very accurate results can be obtained by first neutralizing with normal hydrobromic acid solution, using phenol phthalein as indicator, calculating the carbonate of potassium thus found into bromide of potassium and deducting this amount from the total bromide of potassium, as estimated subsequently with silver nitrate test solution.

It will be seen, by an examination of the table, that very reliable bromide is supplied by five out of the six manufacturers here represented.

Two samples from A and one sample from B were rejected as failing to answer the U.S.P. tests. From C, however, we find a large proportion of the samples had to be rejected.

In most of these the crystals were small and badly formed; often aggregated into flat cakes, and conveying the impression that they formed the last crystallization from very concentrated mother liquors, which would account for the high percentage of impurities.

1903	A.	1903	B.	1903	C.	1903	D.
	<i>p. c.</i>		<i>p. c.</i>		<i>p. c.</i>		<i>p. c.</i>
Jan. 27	96.8	Feb. 17	98.97	Jan. 22	94.8 { excess of KCl and very alkaline.	Feb. 17	99.4
Feb. 17	98.9	Mch. 19	95.80 ²	" 24	94.8 " "	April 30	99.6
Mch. 11	99.5	" 25	98.6	Feb. 20	97.4 " "	May 26	99.9
" 19	95.8	April 3	97.0	Mar. 19	90.9 " "	June 3	97.0
" 25	98.1	" 8	97.0	" 21	98.6 " "	" 18	99.3
April 4	99.1	" 9	98.0	April 14	97.0 " "	July 15	99.6
" 8	97.0	" 14	99.2	May 12	91.8 " "	Sept. 2	99.0
" 14	98.0	" 20	99.6	" 16	89.6 " "	" 29	98.9
July 12	99.3	" 29	99.3	" 20	91.5 " "	Dec. 18	98.3
Aug. 28	99.15	May 6	99.49	" 26	96.2 bad color and dirty.	1904	
Sept. 21	98.0	" 18	99.8	Aug. 21	99.1 { excess of KCl and very alkaline.	April 15	99.2
" 25	98.7	" 20	98.4	" 24	93.5		
" 28	99.3 ¹	June 3	99.45	Sept. 29	99.6		
Nov. 13	99.15	" 16	99.45	1904		1903	E.
" 19	98.5	" 22	99.3	Jan. 17	97.9	Feb. 3	99.3
" 25	99.8	" 29	97.0	Feb. 19	99.2		F.
Dec. 7	98.6	July 1	97.0	Mar. 14	99.9	1903	
" 22	99.4	Aug. 24	99.3	" 22	99.9	Mar. 21	97.74
" 24	99.4	1904		" 25	99.9	April 17	98.70
1904		Jan. 45	98.8	April 21	95.0 " "		
Jan. 15	99.7	" 20	99.9	" 25	92.0 " "		
" 26	99.9	Feb. 2	99.4	" 26	99.6		
Feb. 25	99.2	" 25	98.8	May 6	95.8 { granulated, bad color and very alkaline.		
May 4	99.1	May 4	98.8	" 6	97.0		
" 4	99.2 ¹	" 12	97.0	" 9	97.0		
" 7	98.8	" 21	98.7	" 21	97.0		
" 18	97.0	June 9	97.0	June 3	95.7 { excess of KCl and very alkaline.		

¹ Granulated.

² Alkaline.

PHARMACY AND CHEMISTRY AT THE WORLD'S FAIR.

BY CARL G. HINRICHS, PH.C.,
St. Louis University.*(Continued from p. 314.)*II.—CEYLON THE ISLE OF SPICE—THE LAND, THE PEOPLE AND THE
DRUGS THEY RAISE.

This large island lies to the southward of both Bombay and Calcutta, the main ports of India. Like many tropical lands, such as Mexico and Africa, the coast region is low, while the inland region is quite elevated, even semi-mountainous. Especially in the northern portion of Ceylon do we find an extended low country, though not marshy; this part is known as the Maritime Region. Thus the land diversifies the climate and consequently also the crops.

Although lying just at the foot of the Indian peninsula, still the climate is not that of Southern India, for the ocean tempers the more pronounced changes in weather prevailing in India proper. Living at the leading seaport, commercial city and capital, Colombo, is thus not oppressive; if, however, a change in climate be desired, a trip inland of a hundred miles brings one to the uplands.

Four seasons are distinguished by the natives, namely, the N. E., S. E., S. W. and N. W. monsoons. During the N. E. monsoon the wind comes from the northeast, etc.

The amount of rainfall here, as elsewhere in the tropics, determines two well-marked seasons, the wet and the dry. But even in the so-called dry season, Ceylon enjoys a moderate rainfall; the terrors of the Indian famine are thus unknown to the Cingalese.

The Government is British, as it has been for the last hundred years. The Dutch lost both Ceylon and South Africa to the English during the Napoleonic wars. Both nations have treated the natives well. The lesson of 1776 has been well learned by England, and now no country has greater success with its colonies; in fact, England is the only great nation that finds them not only self-supporting, but even yielding a profit to the "mother country." To develop the resources of the colony, to teach the natives the English language and not to tread on their customs might be called the three cardinal virtues of the British.

The people are of the same stock as the Hindoos. Their features are very regular, and they do remind one of the Caucasian. Like

all people who have lived long in the tropics, they are very swarthy, of average height, quick and intelligent; with long, straight, black hair, knotted at the back and held up by a peculiar comb-ornament, together with their dark eyes and white teeth, they make a very pleasant and striking impression.

The Cingalese tongue is very musical, there being a preponderance of the vowel tones. No attempt is made by the English to do away with this very ancient language, as the Cingalese have a very rich literature. The native tongue is taught in all the English schools of Ceylon.

The men of Colombo wear long, flowing, light garments, as do all the women. The workmen in the country wear only the comfortable loin cloth.

England has established many schools for the natives, common, technical and medical. The medical school of Colombo turns out many physicians learned in the medicine of the Europeans. Dispensaries in charge of such natives furnish free to the people medical and surgical aid. Some graduates start up a private practice, but the greater part of this work is in the hands of the so-called "native physicians." These have learnt by the experience of the ages where the various herbs, roots, etc., are found and when they may be used. Most of their medicines, as exhibited by Ceylon, are medicated oils. In some cases it was said where the European uses the knife, as in severe compound fractures, these native physicians wrap the injured limb in certain leaves, allow it to remain in perfect rest for a week, when they find the bones have knit. What they use is unknown, as their knowledge passes from father to son, and no one outside the family is taken into confidence.

Those following trade have usually studied at one of the technical schools. The gentleman in charge, Mr. Peter de Abrew, is very polite, speaks fluent English, and is well versed in everything Cingalese. In his general appearance and bearing he reminds one of an educated Frenchman.

The resources of Ceylon are mainly agricultural, though they have a very well-developed graphite industry. Spices, drugs and food are no longer a matter of gathering what nature presents in the jungle, but are followed out along strict agricultural lines.

As stated, two agricultural regions are distinguished in Ceylon, viz., the maritime or lowland, where the main products raised are

cocoanuts, cacao, cinnamon, tapioca, rubber, lemon and citronella grasses, and to a less extent white and black pepper, cloves, nutmegs, sugar cane and bananas may also be mentioned. The upland claims cinchona, coffee, tea and cardamom plantations, while rice, their staple, is grown in both regions.

The great farms are called "estates." Labor is cheap, food is plentiful, the ambient air often supplies all the needed garments, while for a little scratching of the soil, nature richly repays the planter with three crops a year.

The first task of the planter is to clear the jungle or native forest. This comprises many large trees fit for the carpenter, and much underbrush and scrub growth. The large trunks are cut and sold as lumber, while the brush and leaves drying form an excellent fuel to burn the remaining trees, which are fired during the dry season. As a result, a good bed of wood ashes covers the already fertile soil. Here and there the great stumps are left.

Plowing is next in order. This is done with wooden plows, pulled by the hardy and patient beast of burden of the East, the bullock. Horses are never used; they are too valuable and could not stand the hard usage. This superficial plowing would in our country be called a mere scratching of the soil.

All coast lands of the tropics are blessed with the cocoanut tree, from which practically all their wants might be supplied. The great importance of this culture to Ceylon is very artistically shown in the exhibit booth.

All planting takes place in the dry season. The cocoanut, husk and all, is planted in nurseries; in about ten days the young tree is above ground. The next six months are trying ones to the planter, as the "milk of the cocoanut" is changed to a very pithy delicacy for both man and beast. The men standing guard shoot the porcupine and wild hog that delight at this stage to eat only the tender sprouts and this pithy substance. When the young tree has absorbed all the nourishment from the nut, and the wild animals will feed no longer thereof, it is transplanted to the orchard in rows 22 feet apart each way. This space allows for the 15-foot sweep of the leaves of the grown plant and also for ventilation. This distance is now being increased to 30 feet.

The tree grows at the rate of a foot a year. When six years old the trees blossom and bear nuts. While no longer in danger of the

four-footed animals it finds a formidable enemy in a large beetle. This beetle feeds on the crown of the tree, and if it succeeds in eating away the crown before the native notices its presence the tree dies. By tying a human hair about this crown the beetle is repulsed, or if his presence is noticed in the crown, a sharp iron spike of about 5 inches in length is jabbed into the crown; the beetle is impaled and drawn out.

The bud is a peculiar, horn-shaped pod, about 2 feet in length; it has a very graceful curve from tip to tip, gradually increasing in diameter to the centre, where it is about 2 inches thick.

Just previous to bursting into flower the pod is full of a sweetish liquid. Cutting off the tip, this liquid exudes, is collected by the native and called "toddy." This peculiar practice does not kill the plant, as does the similar operation of the Mexicans preparing pulque from the agava, but seems to act as does pruning in our orchards.

The collected juice may be treated in several ways. It is concentrated till crystallization begins, and cooled, when the so-called "jaggery" or palm sugar is obtained. This product, as shown, is in irregular, brownish-yellow slices. Again, suppose the juice is exposed to the air, it promptly ferments and alcohol is formed; if the native now distills, he obtains a pale yellowish, pleasant-flavored sort of brandy. This is sold in Ceylon under the name of "arrack." If not distilled, acetous fermentation sets in and a palm vinegar results; this is brownish and not so perfectly clear as is the wine.

The flower is made up of from six to eleven ivory-white petals, each petal being 2 feet in length and spear-shaped. In the dark-green tuft of foliage the flower shows up beautifully and may be seen a mile away.

A month later a cocoanut rests where the flower was. The native climbs up the tree, using a sliding-rope appliance, and cuts the stem. The nut dropping from even the 90-foot and fully grown tree is uninjured, thanks to a thick, hard husk, surrounding an inch thickness of matted fibres, in turn enclosing the nut-proper.

The husk is cut, the matting of fibre is removed. This fibre is pale brown and up to a foot in length; mats, cloth and brushes are made from this "coir" fibre. The smooth cocoanut is now exposed and is either sold in the market as such or worked up.

The shell is often used to make dippers, cups, carved receptacles, etc.; being quite hard, it takes a beautiful polish.

Halving the nut, the white meat is removed; this is either grated and dried, thus forming the familiar shreds used by the confectioner, or the halved meats are dried and sold as "coprah" to firms in Marseilles and London, which extract the valued cocoanut oil by either solvents or pressure.

The native is not ignorant of the fact that an oil is hidden in the white meats, for oil of Cingalese manufacture and even a model of an oil mill is shown in this exhibit. Of course this mill looks very primitive. Imagine a very large bell-shaped mortar of wood, having inserted therein a formidable pestle; to this latter a heavy timber is firmly spiked, making an angle of 60° therewith; this is in turn attached to another timber by means of a metallic hinge. This third timber is spiked to a long, heavy beam that presses firmly against the contracted portion of the mortar. Bullocks are hitched to the free end of this horizontal beam and furnish the slow but sure motive power. A very effective rotary and sliding motion results, and, as the cocoanut oil is liquid at the temperatures that prevail in Ceylon, the oil is continually tapped.

The pressed cake is much used as a very valuable stock feed.

Returning to our tree, this often attains a height of 100 feet and may live to be 120 years of age. Such a tree is a straight trunk crowned with a tuft of leaves. These leaves have a sweep of 15 to 20 feet along the midrib; from this outward leaflets, 2 to 4 feet long and 2 inches broad, grow. The midribs are used as bristles for brooms, while the leaflets crossed form very effective lattice-work screens and partitions.

The tree trunk makes excellent lumber, being not hard to work, taking an excellent polish, and with its light-brown color, splashed with the darker-colored veins, makes elegant furniture.

So we see this one plant furnishes shelter, raiment, food, drink and even light to the native, for he uses the oil in his lamp.

While the cocoanut is with the culture of tea the most important, still, cinnamon is usually recalled whenever Ceylon is mentioned, and every one knows it to be the finest in flavor and odor. This cinnamon is shown in large bales 3 feet high and a foot in diameter. When the Dutch controlled the spice trade of the world, they burnt the rest of the previous crop when the new supply came in; thus they kept up both the quality as well as the price. Ceylon cinnamon in those days sold at £5 sterling. The chips used by the vola-

tile-oil distiller and drug miller are also shown; these, like the stick variety, have the outer bark scraped off.

What is now of special interest to those making lemon essences, citral, ionone, etc., are the grass oils. Extensive field cultivation in the maritime region supplies the trade with both lemongrass and citronella oils, of which many brands of native distillers are shown.

It is a remarkable fact that rice is grown in both the upland and the maritime region. Rice is called "paddy," and is the staff of life in the East. Tapioca is also prepared, but to a smaller extent. Plantain flour is made by the housewife from the banana grown in the vegetable garden.

Fibres of commercial importance are the palm fibres "kitul" and palmyra, the latter made from the Palmyra palm; both are brown in color and coarser than the more important coir fibre. What will undoubtedly be of much importance in the future is a long, thin, pure white fibre extracted from the East Indian hemp—*Sansevieria zeylanica*. This plant, from its long, spear-like leaves of light green striped crosswise with dark green, is a favorite in our greenhouses for ornamental effects.

Cacao culture is important; the products from the pod to the finished cocoa are shown; also various brands of the cocoa butter.

Cinchona favors the uplands and Ceylon has an increasing culture of the bark; a tasty case of the quills is shown.

Cardamoms, wild and cultivated, have a very prominent place in the display; this is also an exclusive upland culture.

No country can raise too much rubber, and Ceylon estates in the maritime region are looking after this product.

Cloves, nutmegs, mace, white and black pepper find a more subordinate place in the agriculture, but are shown in many trade qualities.

Undoubtedly Ceylon has the most artistically arranged exhibit in the drug line; the booth is light and airy, suggestive of the Orient. Everything is arranged a la Yankee, to show off to the best advantage and kept scrupulously clean. The educational value resides in the fact that many estate scenes, showing the way they work, the plants in various stages of blossoming and bearing fruit, are tastefully placed above the cases of drugs; thus at a glance we have the history of the drug before us.

THE DRUG TRADE IN JAPAN AND THE ORIENT AS
SEEN BY A DRUG TRAVELER.¹

BY EUGENE ROSS.

While Japan has contributed a very fair number to the list of prominent living chemists of to-day, it was not until within recent years that pharmacy received Government support. There are very stringent laws regulating the practice of medicine, as well as numerous schools for the education of doctors throughout the empire, and it is very apparent that the reason for this was due to the fact that the doctors in Japan furnished the medicine with a single fee for medical advice.

The first official Pharmacopœia in Japan had its origin about nineteen years ago, and this was modeled after the German. The German influence was paramount; professors from that country were brought over and taught the science of medicine, and this influence carried when the Government finally encouraged the advancement of pharmacy by establishing pharmaceutical preparatory schools throughout Japan. The German influence was so pronounced that all medical papers as well as the pharmaceutical text-books were printed in German, giving at the same time the Japanese translation. This influence was further exerted to the end that the chemicals imported into Japan for a number of years were practically all of German makes, preferential duty privileges being directed to this channel.

Pharmacy as applied in Japan may be divided into two classes—the chemist, who receives the title Master of Medicine or Yakuzai Shi, and the Baiyuka, the dealer in patent medicines or prepared remedies.

The chemist can open a pharmacy and dispense prescriptions; he is likewise licensed to examine and pass upon all drugs and chemicals brought into the country, and for this latter service he receives from the applicant, who furnishes the drug for examination, a fee. All drugs and chemicals brought into and sold in Japan must be examined, and a certificate guaranteeing their qualities according to the Pharmacopœia standard must be attached to every package

¹ Mr. Eugene Ross, foreign traveler for Johnson & Johnson, gave an account of his journeys in the Far East, covering a period of over two years, at the pharmaceutical meeting of the Philadelphia College of Pharmacy, on May 16th.

sold. Failure to observe this requirement of the law carries a penalty. As a consequence of this, the quality of the drugs sold in Japan is of a very pure and high standard of excellence.

The Baiyuka, or dealer in patent medicines, is limited exclusively to the sale of licensed preparations or the usual order of proprietary remedies, but he is not allowed to prepare or put up medicines or dispense prescriptions; he is limited entirely to purveying ready-made or patent medicines.

Every article in the line of drugs or chemicals sold in Japan must carry an internal-revenue stamp, and this based on 10 per cent. of the selling price; for illustration, an article which would retail at 20 sen would carry a tax of 2 sen. In Japanese currency a yen is equivalent to 100 sen or 50 cents United States gold.

Japan is a very fertile field for the sale of patent medicines, but it would seem as though the minimum in price carried the maximum in quantity. It is not uncommon to find a package containing 500 or 1,000 little pills, and made by hand as well, and equally well formed, retailed through the Baiyuka for 10 sen. No doubt this condition militates against the efforts of foreign manufacturers in exploiting their products in Japan. The usual selling price of patent medicines is from 2 to 10 sen or 1 cent to 5 cents United States gold.

While the laws are very stringently enforced regulating drugs and chemicals as to their purity, a like condition exists for the sale of the Baiyuka remedies. When a manufacturer wishes to exploit or place a new preparation on the market, he must make application to the governor of the province in which he resides, submitting a copy of the formula of the preparation as well as a list descriptive of its merits and the diseases for which it is recommended to give relief. The formula, with a sample of the article, is sent to the Kencho or Hygienic Laboratory of the district, and the Government chemist in charge makes his report; and if for any reason the formula and sample submitted are found deficient or to contain any drugs poisonous in their nature, or so construed, the application is denied. If, on the other hand, the requirements of the law are fulfilled, a charge of 2 yen is assessed against the applicant, and a license of a like amount must be paid each year to the Kencho for the privilege of selling the article throughout the empire. It is understood, of course, that the stamp tax applies also.

The Government support as given to pharmacy has resulted in a large increase in the number of pharmaceutical schools throughout the empire, so that at the present time they are to be found in about every district in Japan; and in Tokyo, the university where the post-graduate course in the higher branches of science is obtained, is where chemistry and pharmacy have been most successfully applied. In this university is founded one of the most complete chemical and bacteriological laboratories in the world.

In view of this law which grants to chemists the right to inspect and pass upon the chemicals and drugs sold in Japan, many of the importers or wholesale dealers in drugs have had their sons educated in pharmacy and qualified as chemists to perform this office, that is, to inspect their own drugs and certify as to their standard. Any chemist who falsely represents, or attaches his seal to an article not found to be up to the Pharmacopœia standard as to purity, is liable to a fine, and if the offence is committed a second or third time, he is disqualified to practice his profession.

In the foregoing remarks I have referred to the position of native pharmacy. The foreign concessions, three or four in number, in the port cities where all foreigners were granted certain locations for habitation and their business houses, pharmacy is represented by mostly English service, and the customs prevailing in the concessions were on a par as found in any English colony, and as well in the States. The foreign stores in Japan are thoroughly modern and up-to-date establishments, presided over by competent managers and a staff of qualified assistants. The stocks carried are very large and complete in every particular.

In July, 1900, when all foreigners in Japan came under Japanese jurisdiction, and were subject to the laws as applied in Japan to its subjects, the effect upon the foreign pharmacist or chemist was somewhat arbitrary in its application, and no little confusion and annoyance resulted from the enactment of the native laws; but the conditions were met, and in due time the foreigner adapted himself to the state. I do not believe, however, that the restrictions which are in force will stimulate the foreign chemist for any advancement of the business interests. The laws usually applied to economic conditions are especially applicable to the foreign pharmacist or chemist in Japan.

Passing from Japan to China, conditions present themselves under

different aspects. There is no law regulating the practice of pharmacy or medicine in China, and the history of China furnishes very unsatisfactory knowledge as to the native practices of these arts; but the foreign representation in China is second to none in the Far East. The foreign stores are among the finest in the East, and they all have very large capital and interests.

The spirit of democracy which prevails in China has its influence on all business, and while there are no restrictions as to the quality of drugs sold in China, the privilege is anything but abused. There is no doubt that this condition is due to the high character of the men engaged in the business of pharmacy. The English, as well as the other foreign chemists, are invariably graduated from home colleges. The foreign medical men in China, many of whom have served their time as steamer doctors, and settled down in the settlements to pursue their profession, are as thoroughly progressive, and have their local organizations and institute sanitariums and hospitals as complete and modern as any to be found elsewhere, either in America or Europe.

Chinese pharmacy is rather obscure in its scope. The Chinese have very peculiar customs and methods in the use of medicines, and it is very difficult for the foreigner to satisfy their tastes. The native prejudice, of course, has much to do with this, but the Chinese who have come in contact with the foreigners and live near the settlements or foreign concessions, in time learn to adopt the use of foreign-made medicines; it is necessary, however, to cater to their fancies in the many little ways so peculiar to the Chinese. They have a marked preference, as well as antipathy to certain colors, and in medicine these customs particularly prevail. An orthodox Chinaman would never think of taking medicine out of a blue bottle, nor drugs wrapped in white with black printing. Red is happy joss, and it is always to be found as the predominating color in everything of a medical nature. Blue and black are mourning colors, and always are in evidence at funerals, and if there is one thing above all others that the average Chinaman desires, it is to avoid getting under the sod.

There are several very progressive and up-to-date pharmacies managed and owned by Chinese. There are three such in Shanghai, who have numerous branches throughout China, and there is also a very large Chinese drug store in Pekin. These Chinese in most in-

stances have received their education by working in foreign stores or by college education, and they carry very large and complete stocks. They are very straightforward and honorable men in their dealings, and they enjoy the confidence and respect of the foreigners in the settlements where they reside.

The Chinese are a very superstitious race, and as a consequence venders of patent nostrums prey on their susceptibilities in this direction by selling medicines put up in a very peculiar and attractive manner, to which wonderful curative properties are applied. Wealthy mandarins will often pay fabulous sums for a medicine claimed to possess the virtue of giving vigor of youth, and I have known of an instance where a pill about the size of a hickory nut encased in wax was sold at a price of \$10.00, this on the strength of the wonderful restorative properties guaranteed for it. Upon examination, this pill was found to be nothing more or less than an extract of ginseng and licorice powder. The great masses in China, however, are on a par with the Japanese, in that they expect a great deal of medicine for a very little money, and the medicines usually sold bring prices ranging from five to ten cents.

There are now in operation two very up-to-date pharmaceutical schools in China, erected for the education of native Chinese, and there is an impetus given to the cause by the introduction of foreign teachers. There are medical colleges also to be found on the same lines.

Hong Kong, an English colony, built on an island, oftentimes called the Gibraltar of the East, is frequently referred to as part of China. The English influence here, of course, is paramount to all others, and the business in Hong Kong is practically controlled by the renowned house of A. S. Watson & Co., Ltd. This company has branches in many of the principal cities of China as well as in the Philippines. They carry enormous stocks and operate thoroughly modern and up-to-date stores.

In the Straits Settlements and Siam the conditions do not change materially. English influences dominate there, as the Settlements are practically an English colony.

In India the same characteristics present themselves as in China and Japan, but the foreign stores, which are in the main operated by English companies, are the largest of their kind in the East. It would require too extensive a report to go into details on the subject of pharmacy applied to India.

In South Africa, which is an English colony, the chemists have all received their education in the home colleges, and very stringent pharmacy laws regulate the practice of the profession there. No finer or more complete pharmacies are to be seen anywhere than in South Africa.

The leading American pharmaceutical products meet with popular favor in South Africa, and there has always been a popular demand for goods of American manufacture on these lines.

REPORT OF THE MEETING OF THE PENNSYLVANIA PHARMACEUTICAL ASSOCIATION.

BY CHARLES H. LAWALL.

The twenty-seventh annual meeting of the Pennsylvania Pharmaceutical Association was held at Cambridge Springs, Crawford County, Pa., on June 21, 22 and 23, 1904, the Hotel Rider being the official headquarters.

Cambridge Springs is a popular Western Pennsylvania health resort, which has established a widespread reputation for the variety and excellence of its numerous mineral springs. It is situated on the Erie Railroad, about twenty-seven miles west of Corry, and about thirty miles south of Erie.

The Hotel Rider is a magnificent building, situated on a hill overlooking the town and capable of accommodating about 600 guests. It is eminently well adapted for convention purposes, as it is furnished with every facility for promoting the enjoyment of the guests, and is provided with a complete theatrical hall in which the business sessions can be held to much better advantage than is possible where one of the parlors of the hotel has to be utilized for the purpose, as is usually the case.

It has been the custom in the past to hold the opening session on Tuesday; but this year, on account of the elaborate preparations of the members from the western part of the State, to show their Eastern confreres as much of the surrounding country as possible, it was necessary for President Frailey to call the convention to order on Monday evening. The opening session was attended by many members who had arrived on Sunday and Monday; but the majority of the members not arriving until Tuesday morning, there was not much business transacted aside from the reception of

the credentials of such delegates as were present. The address of welcome to the members of the association and their visiting ladies was delivered by Mr. McGonigle, president of the First National Bank of Meadville, and was responded to by Mr. J. H. Redsecker, of Lebanon, and Mr. John Patton, of York, the latter being called upon by President Frailey to respond for the ladies, quite a number of whom were present.

The session on Tuesday morning was opened at 9.30, and after hearing a few committee reports, President Frailey read his annual address, First Vice-President L. L. Walton, of Williamsport, presiding. The President's address constituted a comprehensive review of numerous subjects, particularly affecting the welfare of retail pharmacists, and, by its clear and concise language, showed that much care and thought had been spent in its preparation. In it, President Frailey referred to the great interest and enthusiasm which had been shown by many members who had joined at the previous annual meeting, and whose work showed that they appreciated the benefits of membership. He issued a warning against the danger of the association losing its identity on account of lack of original effort, and he stated that there were many issues confronting the smaller county and borough organizations which could best be met by applying local remedies. The trading-stamp craze was spoken of at some length, and the members were warned not to succumb to the specious arguments of those who were trying to introduce them to the trade. The difficulty of obtaining properly qualified clerks was spoken of, and the tendency of many druggists to lose their professional standing by their devotion to ultra-commercialism was deplored. The necessity for patent-law revision was touched upon, and in the consideration of the ever-present "cut-rate" question, the Miles plan was unhesitatingly favored on account of the results which had thus far been accomplished through its agency. Particular mention was made of the lack of interest in committee work, upon the part of the members who have been appointed to these important positions. Praise was given to the members of the State Pharmaceutical Examining Board for the introduction of practical examinations in addition to written examinations held by the Board, and the auxiliary Committees upon Membership were congratulated upon the work which had been accomplished by their efforts. The work of the Legislative Com-

mittee, while not as important during the past year as during the previous year, on account of the Legislature not having been in session, was commended in unqualified terms, and it was stated the work done by the Legislative Committee alone should constitute a sufficient reason for membership in the association, and should place solicitations for membership on a business basis, apart from any question of sentiment. The recommendations which were enumerated at the close of the President's address were as follows:

That part of one session be set aside for addresses by Prof. J. P. Remington, Prof. C. B. Lowe and others on the subject of the American Pharmaceutical Association; that the Pennsylvania Pharmaceutical Association draw up resolutions of support to the N.A.R.D., and that an order be drawn upon the Treasurer for the amount of the per capita tax, basing the figures on the membership as it existed on January 1st; that the pharmacy laws be so amended that a certificate for registered manager be granted only to graduates of such colleges of pharmacy as belong to the American Conference of Pharmaceutical Faculties; and that a resolution be passed in favor of the Mann H. R. bill on patent-law revision and favoring a reduction of the tax on alcohol.

The President's address was then referred to a committee consisting of Messrs. Cliffe, Gorgas, Dice, Siegfried and Ballinger, with instructions to report on the recommendations contained therein.

Prof. J. A. Koch, chairman of the Committee on Papers and Queries, then assumed charge of the meeting, and a number of papers were read. Mr. C. N. Boyd, of Butler, Pa., read a paper on the typhoid epidemic by which that city was recently attacked, and related some amusing occurrences of the erroneous ideas which some of the natives of the rural districts formed of the germs during the excitement attendant upon the examination of the various sources of the water-supply. He stated that one farmer was heard to remark that when he arrived at the top of the hill overlooking the town on that morning, he saw swarms of "gems" arising from the town. (It had happened to be a foggy morning.) Another said that he had never believed in those germs because he had often looked for them and had never seen any until a day or so before, when he had seen three in a glass of water, adding, that "they were about as big as potato bugs."

Professor Remington then read a paper on the subject of "The Di-

ploma as a Prerequisite to the Board of Pharmacy Examinations," which will be published in a later issue of this JOURNAL, and in which the matter was ably and exhaustively considered from every point of view; this paper was followed by another on the same subject, contributed by P. H. Utech, of Meadville. These two papers were then referred to the Committee on President's Address, with power to draw up suitable resolutions. A Nominating Committee was appointed consisting of Messrs. Emanuel, Hay, Cliffe, Haley and Steinmetz, and the meeting adjourned until Wednesday at 9 A.M.

On Tuesday afternoon the members of the Association and their ladies were taken for a trolley excursion to Meadville, the county seat of Crawford County, about fifteen miles south of Cambridge Springs. The route led through the picturesque and historic Venango Valley, traversed by Washington on his first mission to the French at Fort Le Beouf in 1753, and many points of interest were seen, among which may be mentioned the borough of Saegertown, where the Pennsylvania Pharmaceutical Association met in 1893, and Allegheny College at Meadville—this institution being the Alma Mater of the late President McKinley. Upon arriving at Meadville the party changed cars and proceeded to Ponce de Leon Springs, the famous summer resort of Meadville, where refreshments were served and the members were afforded an opportunity to drink the spring water, which is highly impregnated with sulphur. The party returned to the Hotel Rider in time for dinner, and in the evening an excellent concert was given by talent from the Conservatory of Music at Meadville, which was appreciated by all who heard it.

The session on Wednesday was opened early, so as to give the members a chance to take the trolley trip to Erie, which had been announced as one of the features of the entertainment programme.

Mr. Talbot, president of the Proprietary Association of America, was introduced by Mr. W. L. Cliffe, and after being tendered the privileges of the floor he read a short address in which the necessity of maintaining the present harmonious relations was emphasized.

Mr. C. E. Vanderkleed, chemist for Mulford & Co., then read a paper upon suppositories, in which a new form of suppository having a block-tin protective cover was described, the advantages being greater stability in all extremes of temperature, and sterility of the suppository at the time of its insertion. The paper was illustrated by tests of the melting-points of suppositories made in various

ways, and was listened to with much attention by all present. The discussion on Mr. Vanderkleed's paper consuming so much time, the meeting was forced to adjourn before it was concluded and it was carried over until the next session.

The excursion to Erie occupied almost the entire day on Wednesday. The trip was made by trolley, the cars leaving at 10.30 A.M. Upon arriving at Erie the party was taken out to the Lake and royally entertained by the Erie druggists. After witnessing a vaudeville performance at the summer theatre, and being served with refreshments, the party started back to Cambridge Springs, arriving there in time for dinner at 7 P.M.

On Wednesday evening an amateur vaudeville production was given by some of the more talented members of the Association, among whom may be mentioned Mrs. McKean, of Erie; Mr. J. P. Remington, Jr., of Philadelphia; Miss Gorgas, of Harrisburg; Mrs. McMurtrie, of Altoona, and Mr. Faries, of Harrisburg.

The next business session of the Association was called to order by President Frailey on Thursday, at 9.30 A.M., and the first order of business was the reading of a number of committee reports, which had been postponed from the earlier sessions for various reasons. Mr. H. L. Stiles, of Philadelphia, chairman of the Committee on Affiliation with Local Associations, read the report of this committee, in which he stated that very little interest had been shown in the matter by the secretaries of the local associations with whom he had endeavored to get in touch, and that only eight replies had been received in answer to more than fifty letters which had been sent out. He stated that this apathy was probably largely due to the fact that the meeting place this year was so far away from the centre of the State, in consequence of which fact very few of the local bodies would send any delegates to represent them.

The report of the Committee on Trade Interests was presented by the chairman, Mr. Charles Leedom, of Philadelphia, in which a resolution was proposed and carried, denouncing the methods of introducing a substitute for a well-known proprietary article, which has appeared upon the market recently.

The most comprehensive report which was presented was that of the Committee on Adulterations, which was read by Mr. R. H. Lackey, of Philadelphia, in the absence of the chairman, Mr. D. J. Thomas, of Scranton. In this report a comprehensive canvass had been

made of the entire State, and circular letters had been sent out to all of the prominent wholesale and supply houses, asking for any information on the subject. Many interesting and valuable replies were received and embodied in the report, which, when published, will, no doubt, form a valuable addition to the literature on the subject of adulteration.

The report of the Committee on Botany was presented and read by the chairman, Mr. C. H. LaWall, after which the discussion of Mr. Vanderkleed's paper on suppositories was resumed, where it had been interrupted the day before.

Mr. C. H. LaWall then read a paper on the "Detection of Aniline Colors and Salicylic Acid in Articles of Food and Drink," which will be published in a later issue of this JOURNAL, and which outlined processes so simple as to readily enable the retail druggist to apply them. This paper was also illustrated by means of specimens.

A paper which had been contributed by Prof. F. X. Moerk was then read, entitled "Laboratory Notes," in which the author suggested some improvements in the application of the tribromophenol reaction to the estimation of carbolic acid, and in which the use of oil of cassia was suggested as a preservative for starch solution for indicator and test purposes. This paper will appear in a later issue of this JOURNAL.

A paper, also entitled "Laboratory Notes," by Willard R. Graham (see page 389), was read, in which the author gave some analytical results of the examination of a variety of substances which had come under his notice recently, the most interesting of which was the statement that cappock oil, an oil obtained from *Eriodendron anfractuosum*, in quantities as low as 0.5 per cent. when added to pure olive oil, would give a reaction similar to that obtained with cottonseed oil with Halphen's test.

A very interesting paper contributed by Second Vice-President B. E. Pritchard, who is also President of the N.A.R.D., was then read by the author. The title was "Mental Myopia," and in it the author discussed trade conditions in his usual forceful and entertaining style.

Mr. L. L. Walton, first vice-president of the Association, then read a carefully prepared article, which considered the advisability of the retail druggist establishing a directory for nurses.

The Nominating Committee then announced that they were prepared to report, and submitted the following nominations: ,

President, J. A. Koch, Pittsburg; First Vice-President, F. T. Wray, Apollo; Second Vice-President, R. H. Lackey, Philadelphia; Secretary, J. A. Miller, Harrisburg; Treasurer, J. L. Lemberger, Lebanon; Executive Committee, Charles Griffith, Johnstown; W. E. Lee, Philadelphia; L. L. Walton, Williamsport.

The committee also recommended that Bedford Springs be selected as the next meeting place, the time to be June 22, 23 and 24, 1905, with Mr. C. H. Marcy, of Altoona, as local secretary.

The report of the committee was accepted, the candidates as nominated were unanimously elected, and the recommendations of the time and place for the next meeting were unanimously approved.

The report of the Auxiliary Committee on Membership, which was headed by Prof. J. P. Remington and Mr. Louis Emanuel, was read by Professor Remington. It was stated that while the growth of the Association had not reached the phenomenal figures of the previous year, there had been sufficient increase to bring the total membership figures above the 1,000 mark, which places it at the head of all State associations. A list of the individual members who had greatly aided the committee was then read, after which the report of the committee was received with the unanimous thanks of those present.

The report of the Committee on President's Address was then presented by the chairman, W. L. Cliffe. The recommendations of the committee were taken up singly for discussion and adoption, after which the report was unanimously adopted as a whole. The recommendations which were adopted included the endorsement of the Miles plan, the recommendation of the passage of an act amending the pharmacy law so that the applicant for a registered manager's certificate will have to show a diploma from some accredited college of pharmacy, the payment of a per capita tax to the N.A.R.D. on all members in good standing on July 1, 1904, and the endorsement of the Mann H. R. bill No. 13,679.

Mr. C. H. LaWall then read a paper in which attention was called to the prophetic character of the conclusions arrived at by Joseph Priestley in his paper on "Dephlogisticated Air." The meeting then adjourned until 2.30 P.M.

The whole of the Thursday afternoon session and the early part of the evening session of the same day was devoted to the reading of papers; Chairman Koch, of the Committee on Papers and Queries,

having awakened a large amount of interest in this matter with the result that the Pennsylvania Pharmaceutical Association, as usual, heads the list of the various State Pharmaceutical societies both in the number and value of the papers read, and the spirited manner in which some of the papers were discussed showed that the members in attendance were there for profit as well as pleasure.

The following papers were read at these two sessions:

"African Balsam of Copaiba," by Clarence M. Kline. (To be published later in this JOURNAL.)

"Ointment of Mercuric Nitrate," by Clarence O. Snavelly. (To be published later in this JOURNAL.)

"Detection of Formaldehyde," by Albert F. Judd. (See page 389.)

"Coarsely Powdered Talc for Making Aromatic Waters," by J. P. Remington, Jr. (See page 390.)

"Profitable Preparations of Petroleum Products," by F. E. Niece.

"The Salus Bill," by R. O. Schmitz.

"The Advantages of an Annual License," by Louis Emanuel.

"Prescribing Proprietary Remedies," by Clement B. Lowe.

"Is it not Time that Graduation from a College of Pharmacy be Required before Registration?" by H. B. Foresman.

"Preventing Frost on Show Windows," by H. F. Ruhl and Charles E. King, respectively.

"Forms of Advertising Best Adapted to the Needs of Retail Druggists," by John R. Thompson and James S. Gleghom, respectively.

"The Traveling Salesman," by W. O. Skelton.

"The Cause of the Popularity of Carbolic Acid as a Means of Committing Suicide," by Louis Emanuel.

The business sessions closed on Thursday evening with the installation of the newly elected officers, after which the association adjourned to convene at Bedford Springs on June 22, 1905.

Among the many entertainment features of the association which had been provided by the Entertainment Committee, which as usual consisted of Messrs. Bransome, Byers and Busch, there were euchre parties for the ladies, bowling matches, guessing contests, etc., and after the regular meeting of the Association had been disposed of and the convention had formally adjourned, the Entertainment Committee were given complete charge of the proceedings. The cus-

tomary prizes, which this year were more numerous and handsome than ever, were then awarded and the evening closed with the serving of refreshments in the dining-room.

The value of these meetings to the retail druggist has often been dwelt upon at length; so let it suffice to say that the interest which was shown this year in a meeting which was held so far away from the centre of the State shows that the Pennsylvania Pharmaceutical Association is to be congratulated upon the fact that in vitality as well as in point of size, it is surpassed by no other State association.

SOME RECENT LITERATURE.

DETECTION OF FORMALDEHYDE.

Albert F. Judd, in a paper to the Pennsylvania Pharmaceutical Association, utilizes the method employed in the detection of formaldehyde in milk as follows: Ten c.c. of the sample are added to 10 c.c. of a 5 per cent. aqueous solution of sodium hydroxide, containing one or two drops of an alcoholic solution of phloroglucin. If the sample contains formic aldehyde the rose color produced lasts for twelve minutes and then fades to a yellowish-brown, which is permanent; if amylic aldehyde is present, the reddish color fades completely in four minutes, whereas if the sample contains ethylic aldehyde the same result is produced in from six to eight minutes.

LABORATORY NOTES.

Willard Graham (*ibid.*) has examined four samples of yellow cinchona bark and found the alkaloidal content to range from 4.8 to 8.9 per cent. Seven samples of red cinchona bark yielded between 5.7 and 8.8 per cent. of total alkaloids. Five samples of Spanish saffron answered the U. S. P. requirements for ash and moisture; one contained, however, considerably more styles than usual. Of three samples of oil of rose examined one had an unusually low congealing point, 7°-9° C. As the result of examinations of olive oil, the author ascertained that when 0.5 per cent. or more of cap-pock oil¹ was added to olive oil, it produced the same coloration as cottonseed oil in Halphen's test. Mr. Graham states that there is little difficulty in obtaining high-grade table oils.

¹ Cappock oil, probably better known as kapok oil, is obtained by pressing the seeds of *Eriodendron anfractuosum*. The oil is used in soap-making as a substitute for cottonseed oil.

COARSELY-POWDERED TALC FOR MAKING AROMATIC WATERS.

J. P. Remington, Jr. (*ibid.*) obtained from the mines of North Carolina talc in broken pieces, which were broken up and ground in a small mill of the Bogardus type, which consists of a conical feed box, or hopper, which delivers the pieces of material between two discs, revolving horizontally. With this mill he obtained powders of varying degrees of fineness, which were boiled with distilled water containing hydrochloric acid, and afterwards thoroughly washed and dried. A powder ranging between 80 and 120, *i. e.*, one which would pass through a sieve of 80 meshes to the inch and retained by a 120 sieve, was found to be the most satisfactory in making the following aromatic waters: Anise, fennel, cinnamon, peppermint, spearmint and camphor.

H. K.

THE PURIFICATION OF WATER SUPPLIES.

This subject has been taken up by the U. S. Department of Agriculture, and on May 7th, Bulletin No. 64, of the Bureau of Plant Industry, entitled "A Method of Destroying or Preventing the Growth of Algæ and Certain Pathogenic Bacteria in Water Supplies," and prepared by George T. Moore, Pathologist and Algologist, in charge of Laboratory of Plant Physiology, and Karl F. Kellerman, Assistant in Physiology, was issued.

The authors state that "while the best known cases of water pollution are those due to the presence of typhoid and other germs which have given rise to serious epidemics, there are a vastly greater number of water supplies which are rendered unfit for use, not because they are dangerous to public health, but on account of the very offensive odor and taste produced in them by plants other than bacteria."

Data furnished by the leading engineers and superintendents of water companies, in reply to a circular letter sent to them, show that the trouble caused by algæ in water supplies belongs to no particular section of the country, but is of wide distribution, extending from Maine to California, and from Minnesota to Texas, and that it is of the most serious kind, in some instances rendering the water wholly unfit for use.

Because of the unsatisfactory results yielded by the methods now in use for eliminating algæ from water supplies, or because of their great expense, the authors decided to take up the biological phase

of the problem, and see what results would be yielded by making a study of the physiology of the organisms under laboratory conditions, the object being to discover some substance which, because of its toxic action on the algæ, would prevent their growth in water supplies.

In determining such a physiological method it was necessary to consider not only that the remedy must be cheap enough for practical purposes and readily available, but that it must be harmless to man under the conditions used. A large number of substances were experimented with, but copper sulphate gave the most satisfactory results. As stated by the writers, "this salt has a very high toxicity for algæ, and experiments with a number of the forms usually found in reservoirs, and the source of much trouble, have shown that inconceivably small amounts of copper are poisonous in a high degree."

In the method proposed the death points of the algæ were determined by using Van Tieghem cells. Accurate solutions were made with distilled water and 200 c.c. of each solution was pipetted into an Erlenmeyer flask. The algæ, if filamentous forms, were rinsed; if free-swimming, they were concentrated by the Sedgwick-Rafter¹ method from 500 c.c. volume to 5 c.c. volume, and this was added to the treated water, the inaccuracy due to this addition being disregarded. At the same time control experiments were also carried on.

The species tested are divided into three groups, as follows: (1) Those with death points at higher concentrations than 1 part copper sulphate to 1,000,000 parts of water; (2) those with death points between 1 to 1,000,000 and 1 to 5,000,000; and (3) those with death points at greater dilutions than 1 to 5,000,000.

Having demonstrated the effectiveness of copper sulphate as an agent for the destruction of algæ, the authors discuss the effects of copper and its compounds on the animal economy, and arrive at the conclusion that "even if the maximum concentration of copper sulphate necessary to destroy algæ in reservoirs were maintained indefinitely, the total absorption from daily use would be very far below an amount that could produce the least unpleasant effect." In other words, taking a dilution of 1 to 1,000,000, which would in all

¹ Whipple: "The Microscopy of Drinking Water." New York, 1889, p. 15.

cases be sufficiently toxic to prevent the growth of polluting forms of algæ, it would be necessary to drink over 20 quarts of the water a day before an amount of copper sulphate which is recognized as harmless would be introduced into the system, while it would take more than 50 quarts to produce unpleasant or undesirable effects.

There are also two other factors to be considered which would seem to render the danger from the use of copper sulphate in the manner prescribed entirely nil. (1) In most cases the use of a solution of maximum dilution (1 to 1,000,000) would be sufficient to kill all forms and would perhaps not have to be resorted to again for at least some time, or at most very much weaker solutions could be used. (2) Very little of the copper would be found in the water after a few hours, it being combined by the algæ and precipitated in other ways.

The point to be borne in mind in applying the copper sulphate is that it should be thoroughly distributed. The method recommended and used by the Department of Agriculture is as follows: Place the required number of pounds of copper sulphate in a coarse bag—a gunny sack or some equally loose mesh—and, attaching this to the stern of a rowboat near the surface of the water, row slowly back and forth over the reservoir, on each trip keeping the boat within 10 to 20 feet of the previous path. In this manner about 100 pounds of copper sulphate can be distributed in one hour. By increasing the number of boats, and, in the case of very deep reservoirs, hanging two or three bags to each boat, the treatment of even a large reservoir may be accomplished in from four to six hours. There are a few other details to be observed in some cases, but as the Department desires that those contemplating the use of the method consult with them first before making a test of the method, these will not be given.

It remains to be said that the method has been tested in water-cress beds having an extensive growth of algæ, and also in water reservoirs, and that the results have been very encouraging.

In summarizing their experiments with pathogenic bacteria, the authors state that at ordinary temperatures 1 part of copper sulphate to 100,000 parts of water destroys typhoid and cholera germs in from three to four hours. The copper can be eliminated from the water with considerable ease, and thus is afforded a practical method of sterilizing large bodies of water when this becomes desirable.

F. Y.

THE INTERNATIONAL CONGRESS OF ARTS AND SCIENCE.

The programme has now been issued of the congress to be held as part of the Louisiana Purchase Exposition from September 19th to 25th of the present year. The purpose and plan of the congress are thus described :

The idea of the congress grows out of the thought that the subdivision and multiplication of specialties in science has reached a stage at which investigators and scholars may derive both inspiration and profit from a general survey of the various fields of learning, planned with a view of bringing the scattered sciences into closer mutual relations. The central purpose is the unification of knowledge, an effort toward which seems appropriate on an occasion when the nations bring together an exhibit of their arts and industries. An assemblage is, therefore, to be convened, at which leading representatives of theoretical and applied sciences shall set forth those general principles and fundamental conceptions which connect groups of sciences, review the historical development of special sciences, show their mutual relations and discuss their present problems.

The speakers to treat the various themes are selected in advance from the European and American continents. The discussions will be arranged on the following general plan :

After the opening of the congress on Monday afternoon, September 19th, will follow, on Tuesday forenoon, addresses on main divisions of science and its applications, the general theme being the unification of each of the fields treated. These will be followed by two addresses on each of the twenty-four great departments of knowledge. The theme of one address in each case will be the fundamental conceptions and methods, while the other will set forth the progress during the last century. The preceding addresses will be delivered by Americans, making the work of the first two days the contribution of American scholars.

On the third day, with the opening of the sections, the international work will begin. About 128 sectional meetings will be held on the four remaining days of the congress, at each of which two papers will be read, the theme of one being suggested by the relations of the special branch treated to other branches; the other by its present problems. Three hours will be devoted to each sectional

meeting, thus enabling each hearer to attend eight such meetings, if he so desires. The programme is so arranged that related subjects will be treated, as far as possible, at different times. The length of the principal addresses being limited to forty-five minutes each, there will remain at least one hour for five or six brief communications in each section. The addresses in each department will be collected and published in a special volume.

It is hoped that the living influence of this meeting will be yet more important than the formal addresses, and that the scholars whose names are announced in the following programme of speakers and chairmen will form only a nucleus for the gathering of thousands who feel in sympathy with the efforts to bring unity into the world of knowledge.

The organization of the congress consists of:

Director of Congresses—Howard J. Rogers.

Administrative Board—Nicholas Murray Butler, president of Columbia University, chairman; William R. Harper, president of the University of Chicago; R. H. Jesse, president of the University of Missouri; Henry S. Pritchett, president of the Massachusetts Institute of Technology; Herbert Putnam, Librarian of Congress; Frederick J. V. Skiff, director of the Field Columbian Museum.

Officers of the Congress—President, Simon Newcomb, retired professor U. S. N.; Vice-Presidents, Hugo Münsterberg, professor of psychology in Harvard University; Albion W. Small, professor of sociology in the University of Chicago.

The speakers and chairmen in the subjects of more especial interest to pharmacists are:

DIVISION A—NORMATIVE SCIENCE.

Speaker, Prof. Josiah Royce, Harvard University.

DEPARTMENT I—PHILOSOPHY.

Section d, Methodology of Science—Chairman, Prof. James E. Creighton, Cornell University; Speakers, Prof. Wilhelm Ostwald, University of Leipzig; Prof. Benno Erdmann, University of Bonn.

DIVISION C—PHYSICAL SCIENCE.

Speaker, Prof. Robert S. Woodward, Columbia University.

DEPARTMENT 9—PHYSICS.

Speakers, Prof. Edward L. Nichols, Cornell University; Prof. Carl Barus, Brown University.

Section a, Physics of Matter—Chairman, Prof. Samuel W. Stratton, director of the National Bureau of Standards, Washington; Speakers, Prof. Robert W. Wood, Johns Hopkins University; Prof. Francis E. Nipher, Washington University.

Section b, Physics of Ether—Chairman, Prof. Henry S. Carhart, University of Michigan; Speakers, Prof. James Dewar, Royal Institution, London; Prof. DeWitt B. Brace, University of Nebraska.

Section c, Physics of the Electron—Chairman, Prof. Charles R. Cross, Institute of Technology, Boston; Speaker, Prof. Ernest Ruthenford, McGill University, Montreal.

DEPARTMENT 10—CHEMISTRY.

Chairman, Prof. James M. Crafts, Massachusetts Institute of Technology; Speakers, Prof. John U. Nef, University of Chicago; Prof. Frank W. Clarke, chief chemist, U. S. Geological Survey.

Section a, Inorganic Chemistry—Chairman, Prof. John W. Mallet, University of Virginia; Speaker, Prof. Henri Moissan, The Sorbonne, member of the Institute of France.

Section b, Organic Chemistry—Chairman, Prof. Albert B. Prescott, University of Michigan; Speakers, Prof. Rudolf Fittig, University of Strassburg; Prof. William A. Noyes, National Bureau of Standards.

Section c, Physical Chemistry—Chairman, Prof. Wilder D. Bancroft, Cornell University; Speakers, Prof. J. H. Van't Hoff, University of Berlin; Prof. Arthur A. Noyes, Massachusetts Institute of Technology.

Section d, Physiological Chemistry—Chairman, Prof. Wilbur O. Atwater, Wesleyan University; Speakers, Prof. Albrecht Kossel, University of Heidelberg; Prof. Russell H. Chittenden, Yale University.

DEPARTMENT 13—BIOLOGY.

Chairman, Prof. William G. Farlow, Harvard University; Speakers, Prof. Jacques Loeb, University of California; Prof. John M. Coulter, University of Chicago.

Section a, Phylogeny—Chairman, Prof. T. H. Morgan, Bryn Mawr; Speakers, Prof. Hugo de Vries, University of Amsterdam; Prof. Charles O. Whitman, University of Chicago.

Section b, Plant Morphology—Chairman, Prof. William Trelease, Washington University, St. Louis; Speakers, Prof. Frederick O.

Bower, University of Glasgow ; Prof. Karl F. Goebel, University of Munich.

Section c, Plant Physiology—Chairman, Prof. Charles R. Barnes, University of Chicago ; Speakers, Prof. Julius Wiessner, University of Vienna ; Prof. Benjamin M. Duggar, University of Missouri.

Section d, Plant Pathology—Chairman, Prof. Charles E. Bessey, University of Nebraska ; Speaker, Prof. Joseph C. Arthur, Purdue University.

Section e, Ecology—Chairman, Prof. Conway MacMillan, University of Minnesota ; Speakers, Prof. Oskar Drude Kön, Technische Hochschule, Dresden ; Prof. Charles Flahault, director of the Botanic Institute, Montpellier, France.

Section f, Bacteriology—Chairman, Prof. Harold C. Ernst, Harvard University ; Speakers, Prof. Edwin O. Jordan, University of Chicago ; Prof. Theobald Smith, Harvard University.

Section g, Animal Morphology—Chairman, Dr. Leland O. Howard, Department of Agriculture, Washington, D. C. ; Speakers, Prof. Charles B. Davenport, University of Chicago ; Prof. Alfred Giard, The Sorbonne, member of the Institute of France.

Section h, Embryology—Chairman, Prof. Simon H. Gage, Cornell University ; Speakers, Prof. Oskar Hertwig, University of Berlin ; Prof. William K. Brooks, Johns Hopkins University.

Section i, Comparative Anatomy—Chairman, Prof. James P. McMurrich, University of Michigan ; Speakers, Prof. Max Fürbringer, University of Heidelberg ; Prof. Yves Delage, The Sorbonne, member of the Institute of France.

Section j, Human Anatomy—Chairman, Prof. George A. Piersol, University of Pennsylvania ; Speakers, Prof. Wilhelm Waldeyer, University of Berlin ; Prof. H. H. Donaldson, University of Chicago.

Section k, Physiology—Chairman, Dr. S. J. Meltzer, New York ; Speakers, Prof. Max Verworn, University of Göttingen ; Prof. William H. Howell, Johns Hopkins University.

DEPARTMENT 17—MEDICINE.

Chairman, Dr. William Osler, Johns Hopkins University ; Speakers, Dr. William T. Councilman, Harvard University ; Dr. Frank Billings, Rush Medical College.

Section a, Public Health—Chairman, Dr. Walter Wyman, surgeon-general of the U. S. Marine Hospital Service ; Speakers, Prof. Wil-

liam T. Sedgwick, Massachusetts Institute of Technology; Dr. Ernest J. Lederle, Commissioner of Health, New York City.

Section b, Preventive Medicine—Chairman, Dr. Joseph M. Mathews, president of the State Board of Health, Louisville, Ky.; Speakers, Prof. Ronald Ross, F.R.S., School of Tropical Medicine, University College, Liverpool; Prof. Angelo Celli, University of Rome.

Section c, Pathology—Chairman, Prof. Simon Flexner, director of the Rockefeller Institute; Speakers, Prof. Felix Marchand, University of Leipzig; Prof. Johannes Orth, University of Berlin.

Section d, Therapeutics and Pharmacology—Chairman, Dr. Hobart A. Hare, Jefferson Medical College; Speakers, Sir Lauder Brunton, F.R.S., London; Prof. Mathias E. O. Liebreich, University of Berlin.

Section e, Internal Medicine—Chairman, Prof. Frederick C. Shattuck, Harvard University; Speakers, Prof. Clifford Allbutt, F.R.S., University of Cambridge; Prof. William S. Thayer, Johns Hopkins University.

Section f, Neurology—Chairman, Prof. Lewellys F. Barker, University of Chicago; Speakers, Prof. Shibasaburo Kitasato, University of Tokio; Prof. James J. Putnam, Harvard University.

Section g, Psychiatry—Chairman, Dr. Edward Cowles, Boston; Speakers, Prof. Th. Ziehen, University of Berlin; Dr. Charles L. Dana, New York City.

Section h, Surgery—Chairman, Prof. Carl Beck, Post-Graduate Medical School, New York; Speaker, Prof. Nicholas Senn, Rush Medical College, Chicago.

Section i, Gynecology—Chairman, Prof. Howard A. Kelly, Johns Hopkins University; Speakers, Dr. L. Gustave Richelot, member of the Academy of Medicine, Paris; Prof. John C. Webster, Rush Medical College, Chicago.

Section j, Ophthalmology—Chairman, Dr. George C. Harlan, Philadelphia, Pa.; Speaker, Dr. Edward Jackson, Denver, Col.

Section k, Otology and Laryngology—Chairman, Prof. William C. Glasgow, Washington University, St. Louis; Speakers, Sir Felix Semon, C.V.O., physician extraordinary to the King, London; Dr. J. Solis-Cohen, Jefferson Medical College.

Section l, Pediatrics—Chairman, Prof. Thomas M. Rotch, Harvard University; Speakers, Prof. Theodore Escherich, University of Vienna; Prof. Abraham Jacobi, Columbia University.

DEPARTMENT 18—TECHNOLOGY.

Chairman, Chancellor Winfield S. Chaplin, Washington University, St. Louis; Speakers, Prof. Henry T. Bovey, F.R.S., McGill University, Montreal; Mr. John R. Freeman, Providence, R. I.

Section a, Civil Engineering—Chairman, Prof. William H. Burr, Columbia University; Speakers, Dr. J. A. L. Waddell, consulting engineer, Kansas City; Mr. Lewis M. Haupt, consulting engineer, Philadelphia.

Section b, Mechanical Engineering—Chairman, President Alexander C. Humphreys, Stevens Institute of Technology; Speakers, Prof. A. Riedler, Königliche Technische Hochschule, Berlin; Prof. Albert W. Smith, Leland Stanford, Jr., University.

Section c, Electrical Engineering—Chairman, Prof. Arthur E. Kennelly, Harvard University; Speakers, Signor G. Marconi, Italy; Prof. Michael I. Pupin, Columbia University.

Section d, Mining Engineering—Chairman, Mr. John Hays Hammond, New York City; Speakers, Prof. Robert H. Richards, Massachusetts Institute of Technology; Prof. Samuel B. Christy, University of California.

Section e, Technical Chemistry—Chairman, Prof. Charles F. Chandler, Columbia University; Speakers, Prof. Otto N. Witt, Königliche Technische Hochschule, Berlin; Prof. William H. Walker, Massachusetts Institute of Technology.

Section f, Agriculture—Chairman, Hon. James Wilson, Secretary of Agriculture, Washington; Speakers, Prof. Léon Lindet, National Agronomic Institute, Paris; Prof. Liberty H. Bailey, Cornell University.

CORRESPONDENCE.

THE AMERICAN PHARMACEUTICAL ASSOCIATION—SCIENTIFIC SECTION.

To the Members of the American Pharmaceutical Association:

The Committee on Scientific Papers herewith invites papers of scientific interest for presentation to the Section at the fifty-second annual meeting, which will be held at Kansas City, Mo., beginning September 5th.

Believing that the interest in subjects presented is much increased when the papers are printed and ready for distribution at the meetings of the Section, the Committee urges the contributors to send

their papers to the chairman as early as convenient, certainly not later than July 10th.

It is the intention of the committee that all papers accepted for presentation to the Section shall there receive due consideration. In order to accomplish this, and to do away with the necessity of reading many papers by title, it will be essential that strict compliance with Article IV of Chapter 9 of the By-Laws (see Proceedings A. Ph. A., vol. 50, page 1134) be insisted on: "Any person preparing a paper for the Association which shall require more than ten minutes for its reading, must accompany the same with a synopsis which can be read within ten minutes' time. The paper and synopsis must both be furnished the committee of the particular Section to which it refers previous to the first session."

CHAS. E. CASPARI, *Associate*.

W. A. PUCKNER, *Chairman*,

EUSTACE H. GANE, *Secretary*.

73 Wells Street, Chicago.

OBITUARIES.

M. LEIDIÉ, the chief pharmacist of the Necker Hospital, Paris, died November 25, 1903, in his forty-eighth year.

M. Leidié had been chief pharmacist at the Necker Hospital for twenty-two years. He was a member of the Society of Pharmacy of Paris, and had been elected to serve as annual secretary in 1892 and as president in 1899. M. Leidié had done considerable research-work on the metals of the platinum group.

ROBERTS BARTHLOW, Professor Emeritus of Materia Medica in Jefferson College, died in Philadelphia, May 10, 1904, in his seventy-third year.

Dr. Bartholow, who was well known as an author on subjects relating to materia medica and therapeutics, was born in New Windsor, Carroll County, Md., on November 28, 1831, and obtained his degree in medicine from the University of Maryland in 1852. He served as surgeon in the Union Army during the War of the Rebellion. Dr. Bartholow was elected Professor of Materia Medica and Therapeutics in Jefferson Medical College, Philadelphia, in 1879, and was made Professor Emeritus in 1893.

EUGENE DIETRICH, the founder and president of the advisory board of the well-known Chemische Fabrik, Helfenberg, Germany,

died at his home in that city on April 15, 1904, in the sixty-fourth year of his age.

Mr. Dietrich, who was probably the pioneer manufacturer of pharmaceutical galenicals in Germany, succeeded in developing a business and establishing a reputation extending far beyond the borders of his native country.

The annual reports of the scientific work done in connection with his manufacturing establishment, embodied in the well-known "*Helfenberger Annalen*," are generally recognized as having scientific merit, and have been liberally quoted from by the pharmaceutical journals of all countries.

M. I. W.

PHILADELPHIA COLLEGE OF PHARMACY.

MINUTES OF THE QUARTERLY MEETING.

The quarterly meeting of the members of the Philadelphia College of Pharmacy was held June 27, 1904, in the Library, at 4 o'clock, the President, Howard B. French, presiding. Nineteen members were present. The minutes of the annual meeting, held March 28, 1904, were read and approved. The minutes of the Board of Trustees for March, April and May were read by the Registrar, Jacob S. Beetem, and approved.

The Historical Committee had no report to make at this time. The Committee on Necrology reported the death of two members during the year, viz., Dr. William H. Webb and Mr. Frank Luerssen. Memoirs of these members were published in the *AMERICAN JOURNAL OF PHARMACY* for July, pages 348-349.

The delegates to the Pennsylvania Pharmaceutical Association, by their chairman, H. L. Stiles, made a verbal report; a full report will be published in the August number of this *JOURNAL*.

The President made the following appointments:

Historical Committee—George M. Beringer, William J. Jenks, Henry Kraemer, Jacob M. Baer, Martin I. Wilbert.

Committee on Necrology—Henry Kraemer, Gustavus Pile, Samuel P. Sadtler.

Committee on Nominations—C. B. Lowe, William McIntyre, Martin I. Wilbert, Joseph P. Remington, Joseph W. England.

Delegates to American Pharmaceutical Association—Joseph P. Remington, Henry Kraemer, Mahlon N. Kline, W. L. Cliffe, C. B. Lowe.

Prof. Henry Kraemer proposed an addition to the By-Laws, as follows: To be Section 20 of Article VIII. A Committee on Membership, consisting of three members, shall be appointed by the President, annually, at the stated meeting in June. All applications for membership shall be reported to this committee, and it shall be the duty of this committee to consider the ways of increasing the membership, and to report annually in June on the status of the membership in the College. Action on the matter was deferred till the next stated meeting.

Mr. England moved that the Secretary of the College be authorized to make such abstracts of the proceedings of the Board of Trustees as may be deemed proper for publication in connection with the minutes of the College meetings, when Mr. Beringer moved to amend "that such abstracts be first submitted to the President for approval." The motion, as amended, was then adopted.

ABSTRACTS FROM THE MINUTES OF THE BOARD OF TRUSTEES.

The Committee on Instruction recommended that an auxiliary course of instruction be established in the College for students in the first year. Instruction will be given in chemical and pharmaceutical arithmetic; the instruction in this branch to be compulsory.

The Committee also recommended that Charles H. LaWall be elected Instructor in Pharmaceutical Mathematics.

The following named were elected active members: James A. Ferguson, C. Stanley French, E. R. Kennedy, M.D., G. Nelson Thompson, John T. Harbold, and as associate member, William G. Letzkus.

The Committee on Examination reported that the third year examinations proved that the mid-year examination was of decided advantage, stimulating the members of the class and raising the general class average.

M. N. Kline was elected Chairman of the Board of Trustees; G. M. Beringer, Vice-Chairman, and Jacob S. Beitem, Registrar, for the ensuing year.

The Property Committee reported that the College is in good condition.

The Committee on Instruction presented their annual report. This report embraces reports from the members of the Faculty for the year. In the Department of Pharmacy it was recommended that with the month's extension of the third year course there be given more time to Magistral Pharmacy and Pharmaceutical Legislation, and that the optional course in Prescription Compounding be abandoned and be included in the regular course. The course in Commercial Training is now a part of the established instruction of the College and increased interest in it is very general.

Department of Chemistry: The Professor believes that the course in Chemical Arithmetic will be a distinct benefit in overcoming deficiencies in this branch. Additional time will also be given to the subjects of Proximate Analysis and Separation, and Food Adulteration.

Department of Analytical Chemistry: The innovation of having quizzes in this department has proven to be of much value. The resignation of the instructor, Mr. E. E. Wyckoff, was presented and accepted with regret.

Department of Pharmacognosy: Mr. Herbert J. Watson, the instructor, tendered his resignation on account of ill health. It was accepted with regret.

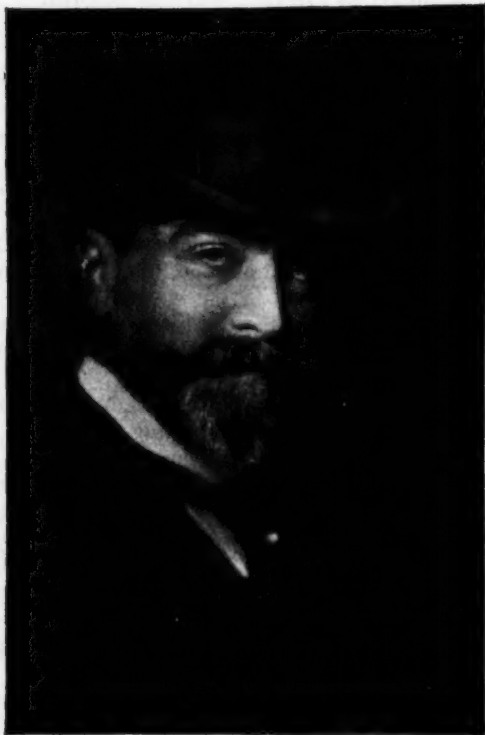
Department of Materia Medica and Physiology: The first year students in this branch passed an unusually good examination.

C. A. WEIDEMANN, M.D., *Secretary.*

THE CHICAGO COLLEGE OF PHARMACY, located for the past twenty years at 465 and 467 State Street, has moved into new quarters at the N. W. corner of Michigan Boulevard and Twelfth Street. The new building is five stories high and has windows on four sides. It is admirably located and furnishes ample accommodations for lectures and laboratory work.

NOTES AND NEWS.

THEODORE WEICKER, Editor of *Merck's Report* and member of the firm of Merck & Co., New York, has by mutual agreement retired from that firm.



The other member of the firm, Mr. George Merck, will continue the business as heretofore, under the same firm name.

Mr. Weicker has been prominently identified with the house of Merck for more than twenty years, and his influence in its council has been recognized both here and abroad. In 1887 he organized the American branch of the house, which has been characterized by high-plane and progressive business methods. The next year he was elected a life-member of the New York College of Pharmacy.

It is not Mr. Weicker's purpose to relinquish his active business life, and on his return from Europe in the spring of 1905, he will re-establish himself in New York under the firm name of THEODORE WEICKER

COMPANY, manufacturers and importers of chemicals and drugs. Meantime, letters and telegrams to him should be addressed care Deutsche Bank, Berlin.

AMERICAN PHARMACEUTICAL ASSOCIATION.—The Fifty-second Annual Meeting will be held at Kansas City, Mo., September 5-10 inclusive, beginning at 3 P.M. on Monday, the 5th. The headquarters of the Association will be at the Coates House, where by special arrangement a rate of \$2.50 per day and upwards, on the American plan, has been secured.

THE MARYLAND COLLEGE OF PHARMACY, having become a department of the University of Maryland, has been installed in the new University Building, in Greene Street, Baltimore. The members of the College faculty other than Prof. D. M. R. Culbreth, who is already identified with the University, were elected members of the University Faculty at a meeting on July 7th.

PROF. H. H. RUSBY, of the New York College of Pharmacy, according to *Torreya*, is now at Kew, engaged in the critical comparison of South American material from the herbarium of the New York Botanical Garden with that preserved in the herbarium of the Royal Gardens.